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ABSTRACT

This paper documents the methodology, research process, process interventions, and the resulting quality indicators of a technology staff development project. The project was designed to assist the administration at an elementary school in San Diego (California) in developing a capacity building model of staff development that would support the effective integration of technology into the curriculum. The aims of the project were to develop basic computer expertise among teachers, while providing them with immediate strategies and resources to assist them in effectively utilizing computers with their students and in their classroom environments. (Author/AEF)

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Collaborative Technology Development: A Staff Development Model for Integrating Computers into School Curriculum

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Abstract: This paper documents the methodology, research process, process interventions, and the resulting quality indicators of a technology staff development project. This project was designed to assist the administration at an elementary school in San Diego, California, in developing a capacity building model of staff development which would support the effective integration of technology into the curriculum. The aims of the project were to develop basic computer expertise among teachers, while providing them with immediate strategies and resources to assist them in effectively utilizing computers with their students their classroom environments.

Introduction

The classroom environment is changing in every school in the United States. Today, 98% of all schools in the United States have computers (Educational Testing Service [ETS],1997). According to the National Center for Educational Statistics (cited in Vojek, 1997), "65% of all US public schools had access to the Internet as of the fall of 1996". During the same period 14% of all classrooms had Internet access, and by the year 2000, it is predicted, that all public schools in this country will have Internet access. What these statistics suggest is that technology access is on the rise in every American classroom. However, more computers and greater access to the World Wide Web in and of themselves guarantee nothing (Foa, Johnson & Schwab, 1997). Their expanding presence does raise questions however about the ways teachers are being prepared to utilize such technology within their classrooms and curriculum. Additionally, this growing presence of technology demands that schools be prepared in providing technological support and training in the use of such resources to staff and teachers. This paper documents one schools journey in meeting this challenge and as such provides a model of a staff development program assisting teachers in their own technological development and the skills for integrating technology into their elementary classrooms

This project was developed to assist the administration at Caesar Chavez Elementary school in San Diego, California, in developing a program for teachers that supported effective integration of technology into the curriculum. The aims of the project were to develop basic computer expertise among the teachers, while providing them with immediate strategies and resources to enable them to utilize computers with their students in their current curriculum and classroom environments.

According to the report, Computers and Classrooms: The Status of Technology in U.S. Schools (ETS, 1997) the average student to computer ratio is ten students for every one computer. At the time of this project (1997-98 school year) the average student to computer ratio at Chavez Elementary, was twelve students for every one computer. Salpeter (1997) stated, that "interactive technology plays little more than an incidental role in classrooms". The rationalization postulated for this incidental role was high student/computer ratios. Salpeter (1997) further stated that this role is often the "result of teaching approaches and curricula that place relatively little value on technology as a tool". This real concern was at the forefront in the planning and development stages of this project. The principal of Chavez Elementary made it clear at the outset of this project that the teaching staff should not only value the technology they would have access to (2 computers and a color printer in every classroom hooked to a school site server), but have effective instruction and support that would allow teachers to effectively utilize the school based technology as a resource tool within their classroom environment.

This paper documents the year long process of technology staff development at Chavez Elementary School, an inner city school with a student enrollment of 600. The project was funded by the Corporation of Public Broadcasting through the Ernest Boyer Summit Next Step Grant project funds. The first two sections

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of this paper document and review the research methodology and scope of the action research process utilized to determine needs and develop relevant training materials and activities. This process was key to the initial and continued support the school staff provided in terms of the spaces created for the development of innovative programs and working relationships. The third section, reviews the sequence of the intervention phases and training models developed. The paper then documents the quality indicators that resulted from this research, including those that led to capacity building among the teaching staff. The final section, provides recommendations for the continued support and development of technology use at Chavez Elementary. It is hoped that this paper will provide a working model for other school sites interested in developing a site-based technology staff development program. A copy of this report and the research tools utilized within this project are available on the project web site at http://edweb.sdsu.edu./plc/cpb/.

Methodology

This project followed a collaborative action research model, which not only accounts for, but values and requires the experiences and perceptions of all participants with the "fundamental aim to improve practice rather than to produce knowledge" (Elliott, 1991) . In this manner the project was designed to include the administrators, teachers, and staff from Chavez Elementary along with the grant administrators from San Diego State University in formulating goals, materials, and activities for technology integration. This was first addressed by creating an on-site Technology Committee, comprised of seven teachers, one representative for each grade level, and the Project Researcher from San Diego State University. The committee met monthly throughout the project year to dialogue about staff and student needs, evaluate software, design and develop technology support materials, and to coordinate and implement on-site training activities. The school staff, with support from the administration, advocated for on-site technology training that addressed the specific needs of the school and community.

Needs assessment instruments, taking the form of surveys and questionnaires were developed and utilized to help guide the process of developing teacher training models, identifying immediate needs and future requirements, and setting goals to ensure quality, comprehensible technology integration. Continual dialogue and reflection was the key to this methodology and contributed to the project's success. To this end the Project Researcher and Technology Committee met with teachers, staff, and administrators regularly to respond to technology concerns and classroom management issues related to the training and integration of computer software and hardware.

Needs assessment data were collected throughout the project via six survey/questionnaire instruments. These instruments were constructed based on the site network server, and computer software and hardware available to teachers at the school site. Teachers and staff were also sent weekly electronic mail (e-mail) messages informing them of curriculum related world wide web (WWW) sites with a request for feedback on their use of these sites. In addition, the Project Researcher gathered informal anecdotal data through classroom observations and conversations with administrators, teachers, and staff to determine effectiveness of the process.

The research process was documented from the beginning of this project via a project web page created utilizing Claris Home page. This creation and maintenance of this website was a requirement of the funding organization, the Corporation of Public Broadcasting.

Research Process

Scope

In order to implement not only the new technology, but training and development it was crucial for the Project Researcher, who was not part of the school community, to establish a collaborative role and to gain the support and trust of the school administration. According to DeBevoise (1986), successful collaboration begins with administrative support along with the ability of the collaborator to gain trust by discovering common and unifying interests, while not becoming involved in the internal politics of the outside institution. At Chavez this relationship was established by assisting in the set-up of hardware and networking communications at the beginning of the school year. Since this was a new school the computers arrived in boxes and required much physical set-up. By being available to assist in the hardware

set-up the Project Researcher established respect and a positive rapport by sharing in the responsibilities at the outset. In addition, relationships were developed and maintained with other staff members through individual coaching sessions. Such sessions, lead by the Project Researcher and members of the Technology Committee, were designed to assist classroom teachers in the basic set-up and use of their classroom computers.

The collaboration process also included visits with the Principal and Resource Teacher to review in-service schedules and technological needs, along with two initial in-services for the teaching staff; one detailing the use of their e-mail software and the second on the use of word processing and drawing software as a computer center. These activities (set-up, coaching, in-services) not only provided the staff with an introduction to the role of the Project Researcher, but also allowed them to see the commitment the Project Researcher had to their school and program. The establishment of commitment and trust early in the project was a key to the success. As DeBevoise (1986) points out: "In the end, collaboration depends on people on both sides being willing to make it work. You can have as elaborate a mechanism as you like, but that won't carry things through. It's the people that matter "(p.12).

Needs Assessment

In order to understand the difference in training models, this project was designed to achieve, it is important to review the training the teachers at this school received in computer use prior to the implementation of this project. The Project Researcher was invited to observe and attend the required two day (12 hours) school district computer training classes. In this class the teachers received computer technology instruction in several software programs and multi-media hardware. Notes from the observation of this training can be found in Table 1. What is important to note here is the vast amount of technological information covered compared to the experience most of the teachers had with computers at this point in time. On the initial survey completed by the teaching staff, 70% indicated that their primary use of computers was for completing word processing tasks indicating that most teachers were unfamiliar with the use of the software being covered and the regular use of computers in general.

I) Instruction in the use of the following software:

a) *Claris Works* word processing, database and mail merge functions, the in-service included practice on sending parent letters, setting up a classroom database and using the information from both to utilize the mail merge function.

b) *Quick Mail Pro* (e-mail software) for this software practice included setting addresses, choosing a background for a message, entering passwords, and sending and receiving e-mail.

c) *Netscape Navigator* this instruction focused on browsing the web and setting bookmarks.

II) Teachers received an overview of multi-media equipment and software that they would have access to in their classrooms, included in this presentation were:

a) a demonstration of using cable television in the classroom

b) the utilization of camcorders and small hand held video cameras

c) brief instruction on how video images could be incorporated into classroom projects.

d) an overview of the school cable network and use for classroom broadcasting.

Table 1: Summary of District Computer Training Session

During these two days of training it was observed that of the 23 teachers attending this in-service 75% had little to no experience utilizing computers. The other 25%, in addition to myself, assisted the technology instructor in coaching teachers through the required tasks. The majority of teachers were frustrated and uncomfortable with the vast amount of information and the limited time they had to practice and absorb what they were being presented with. This became a point of reflection for the Project Researcher and Technology Committee, it was determined that while this was valuable training that all teachers needed, future training needed to be more site-specific and focus on one software or hardware application with instruction at a level where teachers would feel comfortable and not overwhelmed.

To address this concern a needs assessment survey was developed to assist in the development of on-site training. The results from items assessing computer experience (Table 2) revealed that while the majority of teachers were comfortable utilizing word processing software (96%) and basic desktop (95%) applications they also indicated a desire for more specific training in curriculum related software such as *Hyperstudio*

(68%) and *Storybook Weaver* (60%). Programs that were not part of the district training and programs that are more project oriented and student centered.

Item #13: Identify the software and/or hardware applications you are comfortable using.	**Percent of Teachers**
Basic Mac	96%
Claris Works: Word	95%
NetScape - Internet	70%
Claris Works: Spreadsheet	22%
Claris Works: Database	18%
Multi-Media	12%
Item #14: Identify three software and/or hardware applications you would like to receive further training in.	
HyperStudio	68%
StoryBook Weaver	60%
Basic Mac Instruction	50%
Claris Works: Database	45%
Claris Works: Spreadsheet	45%
NetScape - Internet	32%
Multi-Media	23%
Encarta '97 - Encyclopedia	22%
QuickMail Pro	14%
Claris Works: Word & Drawing	12%

Table 2: Results of Items 13 & 14 of Pre-Assessment

Process Interventions

Based on these survey results and continual contact and dialogue with the Chavez administrators and teaching staff, a staff development program consisting of four phases was developed and implemented by the Project Researcher and Technology Committee, these phases consisted of:

Phase 1: School wide In-Service Training Sessions: Trainers: Technology Committee and the Project Researcher; Focus: Using Quick-Mail Pro* Using ClarisWorks Drawing in Computer Centers; Individual Coaching on Classroom Computer Use as requested by teachers.
Phase 2: Weekly e-mail correspondence: Trainer: Project Researcher; Focus: Working with E-Mail and Introducing use of the Internet through curriculum websites.
Phase 3: Technology Training Trees: Trainers: Technology Committee lead other staff members with technology expertise, who in turn trained teachers; Focus: Use of Quick Mail, Mac Basics, Storybook Weaver, and Netscape.
Phase 4: On-Site Workshop Series: Trainers: Technology Committee & Project Researcher;
Focus: HyperStudio, Story Book Weaver Software, Multi-Media Equipment including the Scanner and Projection Unit, Internet and Classroom TV usage, Classroom Management and Curriculum based software, Utilizing the School Network and CD ROM Tower.

Quality Indicators

In order to evaluate the effectiveness of these programs teachers completed evaluation summaries after completing each of the two workshop series. Upon completion of the project the staff completed a post assessment survey to evaluate the program. The results of the Evaluation Summaries, Table 3, indicated that after the first workshop 89% of the teachers believed that the workshops provided them with new methods and strategies that they could use in the classroom, after the second workshop 94% of the teachers agreed with this statement. In addition after the first workshop 89% of the teachers believed that the on-site workshops were a productive use of staff-development hours, and after the second workshop series 100% of the teachers agreed with this item. Overall, the workshop series was a great success partly due to the fact that the sessions were lead by teachers on-site and that participants were able to choose which areas they wanted

training in. The comments received (Table 4) from the teachers revealed that most felt that the workshops were beneficial because of the "hands-on" opportunities and the ideas they were able to put to use "right away".

Workshop Series Evaluation Questions

Q1. These workshops provided me with knowledge of new methods and strategies I can use in my classroom.
Q2. The material presented was relevant to my grade level and subject area.
Q3. I found these on-site workshops to be a productive use of staff development hours.
Q4. I plan to use the computer software demonstrated in the next month.

Response Data: March 13, 1998 Workshop I

	Q #1	Q #2	Q #3	Q #4
Strongly Agree	17	16	15	12
Agree	0	1	2	6
Undecided	2	1	2	1
Disagree	0	0	0	0
Strongly Disagree	0	1	0	0
Percent SA/A=	89%	89%	89%	95%

Total Evaluation Responses = 19*

Response Data: July 17, 1998 Workshop II

	Q #1	Q #2	Q #3	Q #4
Strongly Agree	13	13	14	14
Agree	4	3	4	3
Undecided	1	2	0	1
Disagree	0	0	0	0
Strongly Disagree	0	1	0	0
Percent SA/A=	94%	89%	100%	94%

Total Evaluation Responses = 18* 6 teachers did not respond since they were providing instruction.

Table 3: Workshop Series Evaluation Data

The comparison of the pre and post assessment data and classroom observations, revealed trends of increased knowledge and use of computers in the classroom by both teachers and students, more classrooms utilizing word processing software to complete projects and an increase in the use of HyperStudio, graphics, encyclopedia and CD ROM software within the K-6 curriculum.

In addition, during Phase 4 the Technology Committee wrote and received funding for a district grant project that will support professional development and the integration of new technologies into local education reform efforts. This grant will be funded until the year 2001 by the Patterns Project which is part of Triton, a multi-partner educational collaborative that integrates technology with the standards-based education reform efforts of the San Diego City Schools to create new learning opportunities for students and teachers. It is towards this end that this project assisted in capacity building above and beyond expectations.

The teachers on the Technology Committee began the school year with a vision of assisting teachers in utilizing the computers in their classrooms and by the end of the project were coaching their peers, leading staff development workshops, and finally being the first school in the district to receive a set of *Oracle Computers* for grade 3-6 teachers based on the amount of technology expertise and classroom technology integration at the school site.

I came expecting to...	**I got...**
.. increase my knowledge of software.	..a great hands-on demonstration.
..learn new programs to use in my classroom.	..new ideas on implementing programs.
..be less afraid to incorporate computers in the classroom.	..valuable web sites to use.
.. learn how to use the Internet for my grade level.	..lots of wonderful ideas that I will use right away.
.. learn about general applications for the computer.	..great ideas for using the Internet in my classroom
	..quality instruction!

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I value...	I want next...
..Todd's detailed in-depth explanations.	..how to set-up my launcher with lots of programs for my students.
..the technology we have here at Chavez.	..more practice with spreadsheets and databases.
..my colleagues expertise and assistance.	..a personal visit during class and doing an activity with my class.
.. the time and patience of the tech. instructors.	
.. teachers taking time to develop workshops.	

Table 4: Teacher Comments on Workshop II

Recommendations

Upon completion of the project it was noted that the Technology Training Trees, although not as successful as anticipated, would be implemented again next year with more structure and support. It should be noted that this was a brand new school and in addition to setting up and utilizing technology teachers and staff were also involved in designing and implementing school wide procedures, establishing school policy and teaching at a new school site with a variety of technical and physical interruptions. Thus, establishing the role of technology was part of a multi-faceted school year with many goals and challenges.

The workshop series will continue into the next school year; however in order to allow for more teachers to attend workshops the series will be held more often and with less sessions. The intent is to provide staff and presenters with the opportunity to attend the range of sessions offered over the schools year. The plan is to offer the six workshops from Workshop Series II in groups of three sessions over four staff development days.

Finally, the school site will have, starting with the 1998-99 school year, a computer lab and a full time technology teacher. This project proved successful in laying the groundwork for site-based staff development and has become a model for the further development of technology at Chavez Elementary.

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